

REMARKS

In the last Office Action, the Examiner rejected claim 10 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,519,521 to Okimoto et al. ("Okimoto"). Claims 17-18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Okimoto in view of U.S. Patent No. 5,838,411 to Hayakawa et al. ("Hayakawa").

In accordance with the present response, independent claim 10 has been amended to incorporate the subject matter of independent claims 17-18, which have been canceled, and to define with more specificity the structure of the liquid crystal display device. Non-elected claims 11-16 and 19-29 have been canceled with out prejudice or admission and subject to applicant's right to file a continuing application to pursue the subject matter of the non-elected claims. New claims 30-33 have been added to provide a fuller scope of coverage.

Applicant requests reconsideration of his application in light of the foregoing amendments and the following discussion.

The present invention relates to a liquid crystal display device. As described in the specification (pgs. 1-3), the structure of conventional liquid crystal display devices is such that they do not permit any controller or driver for driving the display devices to provide a frame display outside a display screen in a simple and economical manner without increasing the scale of the driving circuit.

The present invention overcomes the drawbacks of the conventional art. Figs. 1-3 disclose a liquid crystal display device according to the present invention embodied in amended independent claim 10. The liquid crystal display device has a liquid crystal panel 2 comprised of first and second transparent plates spaced-apart from and opposite one another to define a gap therebetween. The first transparent plate has plural segment electrodes for receiving driving segment signals and a dummy segment electrode 4, 5. The second transparent plate has plural common electrodes for receiving driving common signals and a dummy common electrode 1, 3. A liquid crystal layer is disposed in the gap between the first and second transparent electrodes of the liquid crystal panel 2.

The plurality of segment and common electrodes define a plurality of pixels arranged in a matrix for displaying an image. The dummy segment electrode 4, 5 is disposed outside of the segment electrodes defining the pixels for displaying an image. The dummy common electrode 1, 3 is disposed outside of the common electrodes defining the pixels for displaying an image. The dummy segment electrode 4, 5 receives a dummy segment signal waveform (see output of level shift circuit 12 in Fig. 3 in conjunction with signal waveform chart in Fig. 2) so that an effective voltage value between the dummy segment signal waveform and any waveform of the driving common signals exceeds a selection voltage applied across the liquid crystal layer. The dummy common electrode

1, 3 receives a dummy common signal waveform (see output of timing generator circuit 14 in Fig. 3 in conjunction with signal waveform chart in Fig. 2) so that an effective voltage value between the dummy common signal 1, 3 waveform and any waveform of the driving segment signals exceeds the selection voltage applied across the liquid crystal layer.

By this construction and operation of the liquid crystal display device, dots formed by the dummy segment electrode and the common electrodes and dots formed by the dummy common electrode and the segment electrodes are placed in a normally ON state. Thus, a frame can be displayed on a portion of the liquid crystal panel not corresponding to the pixels in a more simple and economical manner and without increasing the scale of a driving circuit as compared to the conventional art. For example, waveforms applied to the segment and common electrodes responsible for the frame display can be formed based on the input signal to a driver IC. This permits any type of controller or driver to provide the frame display outside the display screen in a simple and economical manner without increasing the scale of the driving circuit.

Applicant respectfully submits that the prior art of record does not disclose or suggest the subject matter recited in amended independent claim 10.

Claim 10 was rejected under 35 U.S.C. §102(b) as being anticipated by Okimoto. Applicant respectfully traverses this rejection and submits that amended independent claim 10 recites subject matter which is not identically disclosed or described in Okimoto.

Amended independent claim 10 is directed to a liquid crystal display device and requires a first transparent plate having a plurality of segment electrodes for receiving driving segment signals and a dummy segment electrode, and a second transparent plate having a plurality of common electrodes for receiving driving common signals and a dummy common electrode, the second transparent plate being spaced-apart from and opposite to the first transparent plate to define a gap therebetween, and a liquid crystal layer disposed in the gap between the first and second transparent electrodes.

Amended claim 10 further requires that the plurality of segment and common electrodes define a plurality of pixels arranged in a matrix for displaying an image, the dummy segment electrode is disposed outside of the segment electrodes defining the pixels for displaying an image, and the dummy common electrode is disposed outside of the common electrodes defining the pixels for displaying an image. Claim 10 further requires that the dummy segment electrode receives a dummy segment signal waveform so that an effective voltage value between the dummy segment signal waveform and any waveform of the driving common signals exceeds a selection voltage applied across the liquid crystal layer, and that the

dummy common electrode receives a dummy common signal waveform so that an effective voltage value between the dummy common signal waveform and any waveform of the driving segment signals exceeds the selection voltage applied across the liquid crystal layer. Claim 10 further requires that dots formed by the dummy segment electrode and the common electrodes and dots formed by the dummy common electrode and the segment electrodes are placed in a normally ON state.

Okimoto is directed to an active matrix liquid crystal display device. As recognized by the Examiner, Okimoto clearly does not disclose or describe a liquid crystal display device having a dummy segment electrode disposed outside of segment electrodes defining pixels for displaying an image, and a dummy common electrode disposed outside of common electrodes defining pixels for displaying an image, as recited in amended independent claim 10. In this regard, while Okimoto discloses that "the potentials of common signals applied to the divisional common electrodes are such that the respective exposure regions maintain the same voltage between the pixel electrodes" (col. 3, lines 27-30), and that "it is only necessary to apply, to the common electrode groups, common signals having potentials corresponding to floating capacitances of the TFTs in the respective exposure regions" (col. 8, lines 22-25), such disclosure does not relate at all to a dummy segment electrode and a dummy common electrode, as recited in amended independent claim 10.

Moreover, amended independent claim 10 recites that the dummy segment electrode receives a dummy segment signal waveform so that an effective voltage value between the dummy segment signal waveform and any waveform of the driving common signals exceeds a selection voltage applied across the liquid crystal layer, and that the dummy common electrode receives a dummy common signal waveform so that an effective voltage value between the dummy common signal waveform and any waveform of the driving segment signals exceeds the selection voltage applied across the liquid crystal layer, whereby dots formed by the dummy segment electrode and the common electrodes and dots formed by the dummy common electrode and the segment electrodes are placed in a normally ON state. No corresponding features are disclosed or described by Okimoto.

In the absence of the foregoing disclosure recited in amended independent claim 1, anticipation cannot be found. See, e.g., W.L. Gore & Associates v. Garlock, Inc., 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984) ("Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration"); Continental Can Co. USA v. Monsanto Co., 20 USPQ2d 1746, 1748 (Fed. Cir. 1991) ("When more than one reference is required to establish unpatentability of the claimed invention anticipation under § 102 can not be found."); Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added) ("Anticipation requires the presence in a single prior art reference

disclosure of each and every element of the claimed invention, arranged as in the claim").

Stated otherwise, there must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. This standard is clearly not satisfied by Okimoto for the reasons stated above. Furthermore, Okimoto does not suggest the claimed subject matter and, therefore, would not have motivated one skilled in the art to modify Okimoto's liquid crystal display device to arrive at the claimed invention.

In view of the foregoing, applicant respectfully requests that the rejection of claim 1 under 35 U.S.C. §102(b) as being anticipated by Okimoto be withdrawn.

In addition to the foregoing, applicant respectfully submits that the cited reference to Hayakawa also fails to disclose or suggest the structural and functional combination of the liquid crystal display device recited in amended independent claim 1. In this regard, while disclosing dummy common electrodes (8D1-8D4) and dummy segment electrodes (9D1 -9D43), Hayakawar does not disclose or suggest a dummy segment electrode which receives a dummy segment signal waveform so that an effective voltage value between the dummy segment signal waveform and any waveform of the driving common signals exceeds a selection voltage applied across the liquid crystal layer, and a dummy common electrode which receives a dummy common signal waveform so that an effective voltage

value between the dummy common signal waveform and any waveform of the driving segment signals exceeds the selection voltage applied across the liquid crystal layer, and further that dots formed by the dummy segment electrode and the common electrodes and dots formed by the dummy common electrode and the segment electrodes are placed in a normally ON state, as recited in amended independent claim 10.

Applicant further respectfully submit that newly added claims 30-33 also patentably distinguish from the prior art of record.

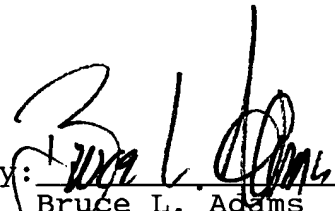
Claims 30-33 depend on and contain all of the limitations of amended independent claim 10 and, therefore, distinguish from the references at least in the same manner as claim 10.

Moreover, there are separate grounds for patentability of new dependent claims 30-33 which are directed to the specific types of dummy common signal waveform (claims 30-32) and dummy segment signal waveform (claim 33). No corresponding features are disclosed or suggested by the prior art of record.

In view of the foregoing amendments and discussion,
the application is believed to be in allowable form.
Accordingly, favorable reconsideration and allowance of the
claims are most respectfully requested.

Respectfully submitted,

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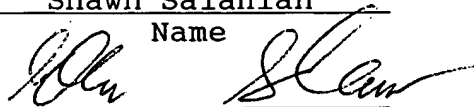
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July 20, 2006